

**ABSTRACT OF THE DISCLOSURE**

5 A controller for apparatus assuming a sequence of precisely synchronized states in accordance with a lengthy event stream is realized in an architecture comprising a register layer comprising a plurality of latched registers for receiving event descriptors and parameters from a bus and a computational/logical layer for operations on/among certain of said parameters for presentation to external operational devices. An RF controller controlling frequency, pulse width, amplitude with precise timing for magnetic resonance applications is one example and a magnetic gradient controller controlling vector magnitude and orientation is another.